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**EXTRACTS FROM THE PRESIDENT'S APPEAL TO FARMERS.**

Let me suggest, also, that everyone who creates or cultivates a garden helps, and helps greatly, to solve the problem of the feeding of the nations; and that every housewife who practices strict economy puts herself in the ranks of those who serve the nation. This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful provident use and expenditure as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring.

The world's food reserves are low. Not only during the present emergency but for some time after peace shall have come both our own people and a large proportion of the people of Europe must rely upon the harvests in America. Upon the farmers of this country, therefore, in large measure, rests the fate of the war and the fate of the nations.

**BACK YARD POULTRY.**

**Suggestions for Care of Small Flock of Hens—Egg Production the Primary Object.**

The keeping of fowls on a town lot or in the back yard is a phase of home production that should be considered by all who desire to supply the table with eggs and meat at a cost considerably below the usual market price. In many towns and cities there are ordinances restricting the keeping of fowls under certain conditions, namely, that the neighbors shall not be annoyed by the crowing of the male birds and that the poultry house must be located a specified distance from any dwelling. Under such conditions a permit should be easy to obtain and the conditions set forth complied with. The male bird in the flock is not necessary for the production of eggs and usually the house can be so located and kept clean that it will not annoy the neighbors.

**The Size of the Lot.**

Ordinarily, the keeping of from 12 to 25 hens is sufficient to provide the average family with eggs and meat. For a flock of 25 hens a space of from 20 to 30 square feet per bird should be allowed, and the yard so divided as to permit them to be alternated from one yard to the other. Thus, a lot 25 by 30 feet, which is even smaller than the average town lot, should be the minimum space for a flock of this size. By having the yard divided cover crops, such as wheat, oats, rape, or rye, can be growing in the unused yard and when sufficiently grown the fowls be allowed to pasture it.

*(Continued on page 4.)*

**CARE OF SMALL FLOCK.**

**Suggestions for the Keeper of Poultry for Home Consumption—Housing and Feeding.**

For the family which wishes to keep poultry for home consumption rather than for the market, the so-called general-purpose breeds are better suited than what are known as the egg-laying breeds. Plymouth Rocks, Wyandottes, Rhode Island Reds, and Orpingtons are all good varieties for the average person who does not intend to go into the poultry business on a considerable scale. These breeds are good layers and they also make good table poultry. Furthermore, they will hatch their own eggs and brood their own chickens, whereas the Leghorns and other breeds of the egg-laying class do not sit, and the use of expensive incubators and brooders is necessary in order to perpetuate these flocks.

The prime essentials for a small poultry house are fresh air, dryness, sunlight, and space enough to keep the birds comfortable. For the general-purpose breeds about 4 square feet of floor space should be allowed for each bird. The fowls should also have as much outside space as possible to run in. If this area is too small, the ground quickly becomes foul and in time makes it difficult to rear chickens with good success. In order to avoid foulness it is advisable to divide the lot and to sow part of it to the quick-growing grains such as oats, wheat, or rye. The hens are turned on to the growing grain when it is a few inches high. Under this method the yards may be changed every three or four weeks during the growing season. A successful combination consists of 6 or 7 pecks of equal parts of oats and wheat to the acre, wheat alone being used for the last seeding in the fall.

The fowls should be fed both a dry mash and a scratch ration. The dry mash may consist of three parts of corn meal and one part of beef scrap. This should be kept before the birds in a hopper all the time. A good scratch ration is made up of equal parts of cracked corn and oats, fed in a litter 4 to 5 inches deep, twice daily. It is desirable that the birds should eat about as much of this as of the mash. This means feeding about 1 quart of mixed grain daily to 12 Plymouth Rock hens or to 14 Leghorns, and an equal weight of mash. Usually waste table products will also be available, and these may be made up into a moist mash in place of the dry mash. In this case the table scrap, if it contains much meat, is substituted for the beef scrap. If it does not contain any considerable portion of meat, it should merely be added to the dry mash already described.

**EXTRACTS FROM STATEMENT BY THE SECRETARY OF AGRICULTURE.**

Through increased attention to poultry on farms it is possible to add quickly and materially to the food supply.

By the immediate preservation of eggs for home consumption through the use of water glass or limewater, larger supplies of fresh eggs may be made available for marketing later in the season, when production is less and prices higher.

When conditions render it feasible small flocks of poultry should be kept by families in villages, towns, and especially in the suburbs of large cities. The need for this extension of poultry raising is particularly great where consumption exceeds production, as in the Northeastern States. Through utilization of table waste, scraps, and other refuse as poultry feed, much wholesome food in the form of eggs and poultry for home use may be produced at relatively low cost.

**FEEDING YOUNG CHICKS.**

**How to Prepare Mash and Grain Mixtures—Overfeeding Injurious—Rations for Various Ages.**

Young chickens should be fed from three to five times daily, depending upon one's experience in feeding, say the poultry specialists of the United States Department of Agriculture. Undoubtedly chickens will grow faster when fed five times than when fed only three times daily, but it should be borne in mind that more harm can be done to the young chickens by overfeeding than by underfeeding. Young chickens should be fed not more than barely enough to satisfy their appetites and to keep them exercising, except at the evening or last meal, when they should be given all they will eat. Greater care must be exercised not to overfeed young chicks that are confined than those that have free range, as leg weakness is apt to result in those confined.

The young chicks may be fed any time after they are 36 to 48 hours old, whether they are with a hen or in a brooder. The first feed may contain either moistened hard-boiled eggs, johnnycake, stale bread, pinhead oatmeal, or rolled oats, which feeds or combinations may be used with good results. Mash mixed with milk are of considerable value in giving the chickens a good start in life. The mixtures should be fed in a crumbly mash and not in a sloppy condition. Johnnycake composed of the following ingredients in the proportions named is a very good feed for young chicks: One dozen infertile eggs or 1 pound of sifted beef scrap to 10 pounds of corn meal; add enough milk to make a pasty mash, and 1 tablespoonful of baking soda, and bake until

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done. Dry bread crumbs may be mixed with hard-boiled eggs, making about one-fourth of the mixture eggs, or rolled oats may be used in place of the bread crumbs. Feed the bread crumbs, rolled oats, or johnnycake mixtures five times daily for the first week, then gradually substitute for one or two feeds of the mixture finely cracked grains of equal parts by weight of cracked wheat, finely cracked corn, and pinhead oatmeal or hulled oats, to which about 5 per cent of cracked peas or broken rice and 2 per cent of charcoal or millet or rapeseed may be added. A commercial chick feed may be substituted if desired. The above ration can be fed until the chicks are 2 weeks old, when they should be placed on grain and a dry or wet mash mixture.

After the chicks are 10 days old a good growing mash, composed of 2 parts by weight of bran, 2 parts middlings, 1 part cornmeal, 1 part low-grade wheat flour or red-dog middlings, and 10 per cent sifted beef scrap, may be placed in a hopper and left before them all the time. The mash may be fed either wet or dry; if wet, only enough moisture (either milk or water) should be added to make the feed crumbly, but in no sense sloppy. When this growing mash or mixture is not used, a hopper containing bran should be accessible to the chickens at all times.

After the chickens are 2 months old they may be fed four times daily, with good results. After they are 3 months old three feedings a day are enough.

When one has only a few chickens, it is less trouble to purchase the prepared chick feeds, but where a considerable number are reared it is sometimes cheaper to buy the finely cracked grains and mix them together. Some chick feeds contain a large quantity of grit and may contain grains of poor quality, so that they should be carefully examined and guaranty as to quality secured before purchase.

As soon as the chickens will eat the whole wheat (usually in about 8 weeks), cracked corn, and other grains, the small-sized chick feed can be eliminated. In addition to the above feeds the chickens' growth can be hastened if they are given sour milk, skim milk, or buttermilk to drink. Growing chickens kept on a good range may be given all their feed in a hopper, mixing 2 parts by weight of cracked corn with 1 part of wheat, or equal parts of cracked corn, wheat, and oats in one hopper and the dry mash for chickens in another. The beef scrap may be left out of the dry mash and fed in a separate hopper, so that the chickens can eat all of this feed they desire. If the beef scrap is to be fed separately, it is advisable to wait until the chicks are 10 days old, although some poultrymen put the beef scrap before the young chickens at the start without bad results.

Chickens confined to small yards should always be supplied with green feed, such as lettuce, sprouted oats, alfalfa, or clover, but the best place to raise chickens successfully is on a good range where no extra green feed is required. Where the chickens are kept in small bare yards, fine charcoal, grit, and oyster shell should be kept before the chickens all of the time, and cracked or ground bone may be fed. The bone is not necessary for chickens that have a good range.

## POULTRY MITES.

### How to Free Poultry Houses—Crude Petroleum Sprays and Sanitary Measures Make Yards Habitable.

Lice by day and mites by night furnish the unhappy condition of poultry kept under insanitary surroundings. Treatments for lice are not effective for mites because the latter work only at night, making raids on the fowls from their hiding places in crevices of the roosts and cracks of the building. To destroy mites and keep the flock free of their depredations, insecticide sprays and a sanitary building are necessary. In "Mites and Lice on Poultry," Farmers' Bulletin 801, F. C. Bishopp and H. P. Wood, of the Bureau of Entomology, United States Department of Agriculture, tell how a complete renovation can be done.

The presence of mites is indicated by small black and white specks on the roosts—the excrement of these insects. The first step is to get rid of the hiding places so far as possible. The roosts should be taken down and all unnecessary boards and boxes removed. In heavily infested houses the mites are to be found in all parts of the building, including the roof. Where they are less numerous, the infestations usually are confined to the roosts and nests and the walls immediately adjacent. For small coops a hand atomizer will suffice for applying insecticides as sprays, but for larger houses a bucket pump, knapsack sprayer, or barrel pump is desirable. A rather coarse spray should be applied from all angles and thoroughly driven into the cracks. The floor also should be treated, as many mites fall to the floor when the roosts are being removed.

Of the several materials that have proved effective, one of the so-called wood preservers, consisting of certain coal-tar products, known as anthracene oil, with zinc chloride added, has given particularly good results. Its repelling power lasts for months. The cost is about \$1 a gallon, but twice the

quantity may be obtained by reducing with equal parts of kerosene.

Crude petroleum is almost as effective, retains its killing power for several weeks, and in most localities it is very cheap. It will spray better if thinned with one part of kerosene to four parts of crude oil.

Both of these materials often contain foreign particles which should be strained out before spraying is begun. It has been found that one thorough application of either of these materials will completely eradicate the mites from an infested chicken house, but ordinarily it is advisable to make a second application a month after the first, and in some cases a third treatment is required. These subsequent applications may be made with a brush, using the materials pure and covering only the roosts, their supports, the walls adjoining, and the nests if they are infested. This method of application is effective for the first treatment also if the houses are not heavily infested. Poultry should be kept out of the treated buildings until the material is well dried into the wood.

Used as a dip, crude petroleum will also destroy the small mite which causes scaly leg. In dipping for this mite *the solution should not be allowed to reach the flesh above the infestation or to get on the feathers.*

## CROPPING PLAN FOR POULTRY.

Green food for poultry may be provided throughout the year in a large portion of the country by using two yards alternately; that is, a crop is pastured in one yard while another crop is growing in the second yard. The following plan is suggested by specialists of the department, as adapted to moderate climatic conditions. The crop grown should be the one best suited to the particular locality. For the extreme North or South the dates should be modified. Thickly sown crops furnish succulent food and summer shade.

### APRIL 1 TO JULY 1.

Growing (yard 1):	Feeding (yard 2):
Oats.	Winter rye.
Chard or lettuce.	Winter vetch.
Clover or vetch.	Crimson clover (New Jersey and South).
Sunflowers (shade and seed).	Sweet clover.
Cowpeas.	
Rape.	

### JULY 1 TO OCTOBER 1.

Feeding (yard 1):	Growing (yard 2):
Oats.	Buckwheat.
Chard and lettuce.	Dwarf Essex rape.
Clover or vetch.	Flat turnips.
Cowpeas.	
Rape.	

### OCTOBER 1 TO APRIL 1.

Growing (yard 1):	Feeding (yard 2):
Oats.	Buckwheat.
Winter rye.	Dwarf Essex rape.
Winter vetch.	Flat turnips.
Sweet clover.	Soy beans.
Crimson clover.	



## CARE OF SITTING HEN.

### Certain Amount of Attention Necessary to Get Best Results—Test for Infertile Eggs.

The sitting hen, which is used most generally for incubation purposes on the farm, should receive a certain amount of care and attention during the process of hatching eggs. To a great extent the care given a sitting hen plays an important part in the number and condition of the chicks when hatched. With this end in view, the poultry specialists of the United States Department of Agriculture make the following suggestions:

If several hens are sitting in the same room, see that they are kept on the nests, allowing them to come off only once a day to receive feed and water, the feed to consist of corn, wheat, or both. If there are any that do not desire to come off themselves, they should be taken off. Hens usually return to their nests before there is any danger of the eggs chilling, but if they do not go back in half an hour in ordinary weather, they should be put on the nest. Where a large number of sitters are kept in one room it is advisable to let them off in groups of from four to six at a time. The eggs and nests should be examined and cleaned, removing all broken eggs and washing those that are soiled; in the latter case the soiled nesting material should be removed and clean straw added. Nests containing broken eggs that the hen is allowed to sit on soon become infested with mites and lice, which cause the hens to become uneasy and leave the nest, often causing the loss of valuable sittings of eggs. In mite-infested nests the hen, if fastened in, will often be found standing over rather than sitting on the eggs.

Many eggs that are laid in the late winter and early spring are infertile. For this reason it is advisable to set several hens at the same time. After the eggs have been under the hens from five to seven days, the time depending somewhat on the color and thickness of the shells—white-shelled eggs being easier to test than those having brown shells—they should be tested, the infertile eggs and dead germs removed, and the fertile eggs put back under the hen. In this way it is often possible to put all the eggs that several hens originally started to sit on under fewer hens and reset the others. For example, 30 eggs are set under 3 hens at the same time, 10 under each. At the end of seven days we find on testing the eggs from all the hens that 10 are infertile, which leaves us 20 eggs to reset, which we do by putting them under 2 hens, and have the remaining

hen sit over again after she has sat only 7 days. In this way considerable time can be saved in one's hatching operations.

### Testing Eggs for Fertility.

An egg, whether impregnated or not, has a small grayish spot on the surface of the yolk known as the germinal spot. As soon as a fertile egg is placed under a hen or in an incubator development begins. All eggs should be tested at least twice during the period of incubation, preferably on the seventh and fourteenth days, and the infertile eggs and dead germs removed. White eggs can be tested on the fourth or fifth day, while the development in eggs having brown shells often can not be seen by the use of an ordinary egg tester until the seventh day. Dead germs soon decay and give off a bad odor if allowed to remain under the hen. Infertile eggs make good feed for young chickens and are often used in the home for culinary purposes. Most incubator companies furnish testing chimneys with their machines, which will fit ordinary lamps. Electric or gas lamps may be used in a box with a hole slightly smaller than an egg cut in the side of the box and at the same level as the light. They may also be tested by sunlight or daylight, using a shutter or curtain with a small hole in it for the light to shine through.

A good homemade egg tester, or candler, can be made with a large shoe box, or any box that is large enough to go over a lamp, by removing the end and cutting a hole a little larger than the size of a quarter in the bottom of the box, so that when it is set over a kerosene lamp the hole in the bottom will be opposite the blaze. A hole the size of a silver dollar should be cut in the top of the box to allow the heat to escape.

The eggs are tested with the large end up, so that the size of the air cell may be seen as well as the condition of the embryo. The testing should take place in a dark room. The infertile egg, when held before the small hole, with the lamp lighted inside the box, will look perfectly clear, the same as a fresh one, while a fertile egg will show a small dark spot, known as the embryo, with a mass of little blood veins extending in all directions, if the embryo is living; if dead, and the egg has been incubated for at least 46 hours, the blood settles away from the embryo toward the edges of the yolk, forming in some cases an irregular circle of blood, known as a blood ring. Eggs vary in this respect, some showing only a streak of blood. All infertile eggs should be removed at the first test. The eggs containing strong, living embryos are dark and well filled up on the fourteenth day, and show a clear, sharp, distinct line of demarcation between the air cell and the growing embryo, while dead germs show only partial development, and lack this clear, distinct outline.

## PRESERVE EGGS.

### Eggs Can Be Kept in Good Condition for Several Months in a Solution of Water Glass or Limewater.

March, April, May, and June are the months when the hens of the country produce about 50 per cent of the lay of the whole year. These are the months, also, when the thrifty housewife who has her own hens or who can draw upon the surplus supply of a near-by neighbor puts away in water glass or limewater eggs for next autumn and winter. To insure success, care must be exercised in this operation. The following directions are from the United States Department of Agriculture.

In the first place, *the eggs must be fresh*, preferably not more than two or three days old. This is the reason why it is much more satisfactory to put away eggs produced in one's own chicken yard.

Infertile eggs are best if they can be obtained; so, after the hatching, exclude roosters from the flock and kill them for the table as needed.

*The shells must be clean.* Washing an egg with a soiled shell lessens its keeping quality. The protective gelatinous covering over the shell is removed by water, and when this is gone the egg spoils more rapidly.

*The shells also must be free from even the tiniest crack.* One cracked egg will spoil a large number of sound eggs when packed in water glass.

Earthenware crocks are good containers. The crocks must be clean and sound. Scald them and let them cool completely before use. A crock holding 6 gallons will accommodate 18 dozens of eggs and about 22 pints of solution. Too large crocks are not desirable, since they increase the liability of breaking some of the eggs and spoiling the entire batch.

It must be remembered that the eggs on the bottom crack first and that those in the bottom of the crocks are the last to be removed for use. Eggs can be put up in smaller crocks and the eggs put in the crock first should be used first in the household.

### Water-Glass Method.

"Water glass" is known to the chemist as sodium silicate. It can be purchased by the quart from druggists or poultry supply men. It is a pale yellow, odorless, sirupy liquid. It is diluted in the proportion of 1 part of silicate to 9 parts of distilled water, rain water, or other water. *In any case, the water should be boiled and then allowed to cool.* Half fill the vessel with this solution and place the eggs in it, being careful not to crack them. Eggs can be added until the container is filled. Be sure to keep about



2 inches of water glass above the eggs. Cover the crock, and place it in the coolest place available from which the crock will not have to be moved. Inspect the crock from time to time and replace any water that has evaporated with cool boiled water.

#### How to Use the Preserved Eggs.

When the eggs are to be used, remove them as desired, rinse in clean, cold water, and use immediately.

Eggs preserved in water glass can be used for soft boiling or poaching up to November. Before boiling such eggs prick a tiny hole in the large end of the shell with a needle, to keep them from cracking. They are satisfactory for frying until about December. From that time until the end of the usual storage period—that is, until March—they can be used for omelettes, scrambled eggs, custards, cakes, and general cookery. As the eggs age, the white becomes thinner and is harder to beat. The yoke membrane becomes more delicate and it is correspondingly difficult to separate the whites from the yolks.

#### Limewater Method.

Limewater is also satisfactory for preserving eggs and is slightly less expensive than water glass. A solution is made by placing 2 or 3 pounds of unslaked lime in 5 gallons of water which has been boiled and allowed to cool, and allowing the mixture to stand until the lime settles and the liquid is clear. The eggs should be placed in a clean earthenware jar or other suitable vessel and covered to a depth of 2 inches with the liquid. Remove the eggs as desired, rinse in clean, cold water, and use immediately.

## BACK YARD POULTRY.

(Continued from page 1.)

For a yard 25 by 30 feet, or 750 square feet in size, the above-mentioned grains may be sown in the following amounts: Wheat, 2½ pounds; oats, 1½ pounds; rye, 3¼ pounds; rape, 2½ ounces. When available, lawn clippings make excellent green feed for fowls.

In this way the contamination of the soil and the possibility of disease are reduced to a minimum, and at the same time green food is provided.

#### The Breed.

The actual selection of the breed should not be a difficult matter when one considers that more depends upon the way fowls are managed than upon the breed itself. Pure-bred fowls of the general-purpose or egg type purchased for a reasonable figure are well

suited for backyard poultry plants. However, when pure-bred fowls can not be obtained, grades properly cared for and fed will usually produce sufficient eggs and meat for the table of the average family.

#### Feeding for Eggs.

The actual purpose of keeping a small flock of fowls is primarily for egg production. Consequently, they should be fed with this end in view. Practically every housewife has a quantity of table scraps, vegetable peelings, and "left overs" that can be utilized by feeding to hens. Supplementary to such feed, however, a grain and dry mash should be provided in order to produce the best results. By supplying the fowls with all available table scraps it will usually cost from 50 to 75 cents a year per fowl for grain and other feeds. A good egg-laying ration should consist of the following: Three parts corn meal and one part beef scrap mixed together and fed in a dry-mash hopper to which the fowls will have access at all times. In addition to this a scratch ration consisting of equal parts cracked corn and oats should be fed twice daily. When no table scraps are available it will take about 1 quart of scratch grain daily for 12 to 14 fowls. However, this can be reduced when table scraps are fed and a certain amount of natural green feed such as grass is available.

#### Housing.

In providing the fowls with a suitable house it should be remembered that the essentials of such a building are fresh air, dryness, sunlight, and sufficient space so that the fowls will not be crowded. Usually each fowl should be allowed 4 square feet of floor space. If available, scrap lumber from dry goods boxes, etc., can be utilized to construct such a house. The cost will be considerably less than when lumber is purchased. If sufficient lumber is not available for the entire house a rough framework well covered with ordinary roofing or tar paper will answer the immediate needs.

#### Renewing the Flock.

When the heavier fowls (Plymouth Rocks, Wyandottes, Rhode Island Reds, etc.) are kept all females should be disposed of at the end of their second year, inasmuch as in most cases they will cease to be profitable at the end of that time. The lighter breeds (Leghorns, etc.), however, can be profitably kept as long as three years. By disposing of the hens in this way a part of the flock must be renewed each year. Consequently, considering that the percentage of cockerels and pullets is usually about the same, and that a certain percentage will die before reaching maturity, it is customary to hatch more chicks each year than there are hens in the flock.

## CHICKEN LICE.

### Sodium Fluorid, a Newly Discovered Remedy, Rids Fowls Quickly of All Such Parasites.

One application of sodium fluorid will kill all lice of chickens, entomologists of the Department of Agriculture have discovered. This inexpensive white powder, they find, will rid a flock of all the seven common species of chicken lice in a few days. One pound, costing only 40 or 50 cents at the time of this writing, is enough to treat 100 fowls, if dusted on. If dissolved in water and used as a dip, the same amount will go three times as far. It is easily applied, economical, gives immediate results, and does not injure the fowls or the poultryman.

The complete effectiveness of the sodium fluorid remedy and methods of using it are discussed in Farmers' Bulletin 801 of the United States Department of Agriculture, "Mites and Lice on Poultry," by F. C. Bishopp and H. P. Wood. The bulletin deals also with mites, the night pests of chickens, which require a different treatment. Lice are the biting insects that work by day and are a serious foe in neglected small flocks of general farms and back yards.

Sodium fluorid—say it plainly to the druggist or you may get sodium chlorid, common salt, which it not only resembles in name but in appearance—may be obtained at most large drug stores. Until its recent use against cockroaches, and still more recently against poultry, this substance had not been employed as an insecticide. The demand for it, therefore, has been quite limited, and it is not ordinarily found in the stock of the small drug store. Druggists, however, can obtain it readily from manufacturing chemists, and with demand, it likely will be carried by local dealers. The finely powdered commercial form is cheaper and more easily applied by the dusting method than the fine, crystallized sodium fluorid.

#### Dusting with Sodium Fluorid.

To apply the material in dust form, place it in an open vessel on a table and with one hand hold the fowl by the legs or wings. With the other hand place small pinches of the chemical among the feathers next to the skin, according to what is known as the "pinch" method, which proceeds as follows: One pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one on the tail, one on either thigh, and one scattered on the under side of each wing when spread. Each pinch can be distributed by pushing the thumb and fingers among the feathers as the material is released. If the chicken is held over



the vessel, the material which falls from the fowl during the operation is recovered.

The material also may be applied by means of a shaker, but this method has some disadvantages as compared with the "pinch" method. When this method is used the amount of sodium fluorid may be reduced by adding four parts of some finely powdered material, such as road dust or flour, to each part of the fluorid. The dust, while not poisonous, is somewhat irritating to the nose and throat. If allowed to remain on the skin in any quantity for any great length of time, it may cause slight local irritation. For these reasons, those dusting a large number of chickens would do well to cover nose and mouth with a dust guard or damp cloth and to wash their hands occasionally.

#### Dipping with Sodium Fluorid.

The dipping method is more economical, but among many poultry raisers there is a general sentiment against the practice of dipping fowls, largely because most of the dips contain materials which discolor the feathers. The sodium fluorid dip, however, is harmless and as compared with dusting is more easily done. As it is necessary that the fowls dry quickly, dipping is most applicable in the Southern States and to summer treatments in the North. For lice on young chickens, young turkeys, and, in fact, all newly-hatched or sick fowls, the application of sodium fluorid in the dust form is recommended.

This is the way the dip is prepared: In a tub of tepid water dissolve the poison at the rate of  $\frac{3}{4}$  to 1 ounce of the commercial powder, or  $\frac{2}{3}$  of an ounce of the chemically pure material, to each gallon of water. The fowls should be held by the wings over the back with the left hand and quickly submerged in the solution, keeping the head out, while the feathers are ruffled with the other hand to allow the dip to penetrate to the skin. The head then should be dipped once or twice and the bird lifted and allowed to drain a few seconds. A fowl may be treated in 30 to 45 seconds. The sodium fluorid solution should not be allowed to remain long in galvanized vessels as its action on this metal is injurious. The solution does not injure the hands unless it comes in contact with sores, when it may cause slight irritation.

In experiments conducted by the department's specialists more than 800 fowls have been dipped at one time, using on the average 5.2 ounces of sodium fluorid to 100 birds, at a cost of 13 cents. Labor is also reduced by dipping, the cost being about 58 cents for 100 fowls.

It has been found that a few thorough applications of crude petroleum to the interior of poultry houses will destroy the common red mite infesting chickens.

## BROODING CHICKENS.

### Recommendations of Department's Poultry Specialists for Care of Hen and Young Chickens.

The proper brooding of chickens is one of the most difficult operations on many poultry farms, especially for the beginner. Many poultry keepers who are able to obtain good egg yields and fair hatches make a failure of brooding chickens, either in raising only a small percentage of the chickens hatched or in failing to rear strong, vigorous birds which develop into good breeding stock. Brooding is still in the experimental stage, and no one system has given perfect satisfaction. The poultry specialists of the United States Department of Agriculture advise the following procedure:

#### Rearing Chickens with Hens.

Sitting hens should be confined to slightly darkened nests at hatching time and not disturbed unless they step on or pick their chickens when hatching, in which case the chickens should be removed as soon as dry, in a basket lined with flannel or some other warm material, and kept near a fire until all the eggs are hatched; or the eggs may be removed and placed under a quieter hen whose eggs are hatching at the same time.

An incubator may also be used to keep the earliest hatched chickens warm, in case they are removed from the nest. If the eggs hatch unevenly, those which are slow in hatching may be placed under other hens, as hens often get restless after a part of the chickens are out, allowing the remaining eggs to become cooled at the very time when steady heat is necessary. Remove the eggshells and any eggs which have not hatched as soon as the hatching is over. Hens should be fed as soon as possible after the eggs are hatched, as feeding tends to keep them quiet; otherwise many hens will leave the nest. In most cases it is best that the hen remain on the nest and brood the chickens for at least 24 hours after the hatching is over.

Powder the hen with a good insect powder before moving her and the chickens to the brood coop. The hen should be dusted every two weeks, or as often as necessary, until the chickens are weaned. If lice become thick on the chickens, or if they are troubled with "head lice," a very little grease, such as lard or vaseline, may be applied with the fingers on the head, neck, under the wings, and around the vent. Great care should be taken, however, not to get too much grease on the chickens, as it will stop their growth and in some cases may prove fatal.

The brood coop should be cleaned at least once a week and kept free from mites. If mites are found in the coop, it should be thoroughly cleaned and sprayed with kero-

sene oil or crude petroleum. From 1 to 2 inches of sand or dry dirt or a thin layer of straw or fine hay should be spread on the floor of the coop. Brood coops should be moved weekly to fresh ground, preferably where there is new grass. Shade is very essential in rearing chickens, especially during warm weather; therefore, the coops should be placed in the shade whenever possible. A cornfield makes fine range for young chickens, as owing to cultivation of the ground they get many bugs and worms and have fresh soil to run on.

#### HOW TO SET A HEN.

As the time approaches for the hen to become broody or sit, if care is taken to look into the nest, it will be seen that there are a few soft, downy feathers being left there by the hen; also the hen stays longer on the nest when laying at this time, and on being approached will quite likely remain on the nest, making a clucking noise, ruffling her feathers, and pecking at the intruder. When it is noted that a hen sits on the nest from two to three nights in succession and that most of the feathers are gone from her breast, which should feel hot to the hand, she is ready to be transferred to a nest which has been prepared for her beforehand, according to the poultry specialists of the United States Department of Agriculture. The normal temperature of a hen is from 106° to 107° F., which varies slightly during incubation.

Dust the hen thoroughly with insect powder, and in applying the powder hold the hen by the feet, the head down, working the powder well into the feathers, giving special attention to regions around the vent and under the wings. The powder should also be sprinkled in the nest.

The nest should be in some quiet, out-of-the-way place, where the sitting hen will not be disturbed. Move her from the regular laying nest at night and handle her carefully in doing so. Put a china egg or two in the nest where she is to sit and place a board over the opening so that she can not get off. Toward the evening of the second day quietly go in where she is sitting, leave some feed and water, remove the board from the front or top of the nest, and let the hen come off when she is ready. Should she return to the nest after feeding, remove the china egg or eggs and put under those that are to be incubated. If the nests are slightly darkened the hens are less likely to become restless. At hatching time they should be confined and not be disturbed until the hatch is completed, unless they become restless, when it may be best to remove the chicks that are hatched first. In cool weather it is best not to put more than 10 eggs under a hen, while later in the spring one can put 12 or 15, according to the size of the hen.



## PRODUCE WINTER EGGS.

### Proper Feeding and Care of Chickens Will Result in Increased Egg Production During Winter.

The production of eggs in winter from pullets, and to some extent from hens, can be greatly stimulated by good methods of feeding, housing, and handling. Very few eggs are secured on the average general farm during the fall and early winter, when eggs bring the highest prices. Poultrymen, however, by better management secure a fair egg production during these seasons.

To receive good results from a flock of poultry during the winter all houses and coops should be in good condition, only healthy fowls placed in these buildings, and good care given to the poultry. These houses should be thoroughly cleaned, disinfected, and made tight for winter. If the house has a dirt floor, it is well to remove the top 3 or 4 inches of dirt and replace it with fresh dirt or sand. If it has a cement or wooden floor, remove all litter and dirt and put in 4 or 5 inches of fresh straw or litter. Be sure that the house is tight on three sides and that there is no chance for a draft to strike the hens. If hens roost or are placed in a draft during the fall and winter, colds are sure to develop, which may result in roup and other troubles. From one-third to one-half of the south side or front of the poultry house may be made of curtains and windows, but should be under control, so that the openings may be closed gradually as the weather becomes cold. Have muslin curtains in the front of the house or leave a window partly open, even on the coldest nights, to allow some ventilation in the house. Fowls will stand considerable cold air provided it is dry, and ventilation will keep the air thoroughly dry in the house.

Before the pullets are mixed with the older fowls be sure that the hens are banded or that the web of the foot is punched in some way so that you can distinguish between the pullets and the hens. In this way the older stock may be culled out whenever it appears desirable and the young hens kept for further laying. Do not keep hens of the heavier breeds for egg production over two years, but some of the best hens may be kept for breeders until 3 or 4 years old. Leghorns can be kept profitably for egg production for three years. The pullets that mature early in the fall and that molt late as hens are usually the best layers and should be saved for breeding stock. Cull the chickens which are brought into the laying house carefully, and fatten and market all chickens which are small, poorly developed, or in poor condition. These small, poorly developed chickens are apt to catch cold if put in with the other poultry and develop

diseases which quickly spread through the flock.

In order to get the greatest egg production in the early fall and winter it is essential to have well-matured pullets which were hatched in March or April, or even earlier in the Southern States. By early hatching and by supplying good conditions for egg production more eggs will be produced in the fall and winter, while a larger proportion of hens will go broody early in the spring, thus completing the necessary circle for early fall egg production.

Feed the grain in the litter on the floor and make the hens exercise for all of their grain. The mash may be fed either wet or dry, and should be so regulated that the fowls will get about equal parts of mash and of the scratch grains. It is necessary to give the fowls plenty to eat to get good results, but the birds should always be eager for each feed. In cold weather feed about one-third of the scratch grains in the morning and two-thirds at night. In this way the hens are forced to exercise more than if given all the grain they desired at the morning feed. Scratch grains, mash or ground grains, animal protein, green feed, grit, and shell should be supplied in the winter. Good scratch mixtures may be made of equal parts, by weight, of cracked corn, wheat, and oats, or of two parts of cracked corn and one part each of wheat and oats. If wheat is relatively very high in price it may be left out of these mixtures. In addition a mash made of three parts corn meal and one part each of wheat bran, wheat middlings, and beef scrap may be fed, or a mash consisting of three parts corn meal and one part beef scrap has been found to give splendid results. Green feed, such as cabbages, mangel wurzel beets, cut alfalfa, or sprouted oats should be fed during the winter to replace the green feed which the fowls have been securing in the fields; and beef scrap, skim milk, cut green bone, or some similar feed is needed to replace the bugs which the fowls have been securing on the range.

Beef scrap or feed of this nature is very essential in securing a good supply of eggs during the winter months and is the one essential feed often omitted by farmers. In the experiments conducted by the department an average production of 41.5 eggs for the first four months from pullets fed a ration containing beef scrap was secured compared with 18.7 eggs from pullets fed the same ration without the beef scrap. The pullets not fed beef scrap practically stopped

laying whenever the ground was covered with snow. The feed cost of their eggs was 2.2 cents higher per dozen for the year than for the pullets fed beef scrap. Skim milk or buttermilk will largely take the place of beef scrap, if a constant supply can be kept before the fowls, but if the supply of milk is limited some beef scrap should also be fed.

People raising poultry as a side issue in towns and villages can utilize waste products from their table and kitchen to very good advantage, producing fresh eggs and poultry for their own use as well as some surplus for market. As these scraps contain some waste meat, the proportion of beef scrap in the mash can be reduced accordingly. These table scraps can be mixed with the ground grains and fed as a moist mash.

Clean the dropping boards at least once a week, and spray the roosts once a month during the winter with kerosene or some commercial preparation for killing mites. Have a good supply of sand or dry dirt on hand to use on the dropping boards during the winter.

If any of the birds develop colds, put as much potassium permanganate as will remain on the surface of a dime into a gallon of water and keep this material in their drinking water for several days, or until the symptoms of the colds have disappeared. Remove any sick birds from the flock as soon as noted and treat them in coops by themselves or kill and bury them if they are not worth treating.

Examine the pullets and hens for lice and dust thoroughly with a good insect powder or apply a mixture of equal parts of vaseline and mercurial or blue ointment, applying a piece about the size of a pea 1 inch below the vent of the bird, rubbing the mixture lightly on the skin. An application of this ointment two or three times a year will keep the fowls free from lice. Where insect powder is used, it should be applied three or four times a year, or oftener if the fowls become infested with lice. Provide a small box in the house, partly filled with dry road dust or fine dirt, in which the hens may dust themselves, thus helping to keep them free from lice.

For the first three days chicks may be fed a mixture of equal parts hard-boiled eggs and stale bread, or stale bread soaked in milk. When bread and milk are used, care should be exercised to squeeze all milk out of the bread. From the third or fourth day until the chicks can eat wheat and cracked corn commercial chick feed is a good ration.

#### ROTATION FOR POULTRY YARDS WHICH HAS PROVED PRACTICAL IN SOME LOCATIONS.

Date.	Yard A.	Yard B.
Mar. 1 to Apr. 30.....	Peas and oats.....	Feeding.
Apr. 30 to May 25.....	Feeding.....	Peas and barley.
May 25 to June 15.....	Dwarf Essex rape.....	Feeding.
June 15 to July 10.....	Feeding.....	Buckwheat and oats.
July 10 to Aug. 1.....	Buckwheat.....	Feeding.
Aug. 1 to Aug. 20.....	Feeding.....	Cowpeas and millet.
Aug. 20 to Sept. 20.....	Rye, vetch, clover.....	Feeding.
Sept. 20 to Dec. 1.....	Feeding.....	Rye and vetch.



## COOP MOTHER HEN.

### Loss of Chicks by Exposure Largely Prevented by Confining the Hen in a Coop.

It is not good poultry management to allow the mother hen to range unrestricted with her chicks. With such freedom the hen frequently takes her brood through wet grass, and as a result some are chilled and die, especially the weaker ones, which are likely to be left behind. The loss of young chicks which follows such a practice is large and mainly preventable, specialists in the United States Department of Agriculture say. Furthermore, the food which a brood allowed to range with the hen obtains goes very largely to keep up the heat of the body and the chicks do not make as good growth as they otherwise would.

Chick losses of this nature can be largely prevented by shutting the hen in a coop. Any style of coop which is dry, ventilated, and can be closed at night to protect the brood against cats, rats, and other animals, and which, while confining the hen, will allow the chicks to pass in and out freely after they are a few days old, will be satisfactory. The hen should be confined until the chicks are weaned, though a small yard may be attached to the coop, if desired, to allow the hen to exercise. The fence can be raised from the ground far enough to allow the chicks to go in or out, but not high enough for the hen to escape. By using a coop the chicks can find shelter and warmth under the hen at any time, and the weaklings after a few days may develop into strong, healthy chicks.

Where chicks are raised with hens, they are likely to become infested with lice. If the lice get very numerous, they greatly retard the chicks' growth and may even cause their death. The hen should be powdered thoroughly with some good insect powder before she is put in the coop with the chicks and at intervals of several days or a week thereafter. The baby chicks should be examined for lice, particularly on the head, under the wings, and about the vent. If any are found, a little grease, such as lard, should be rubbed on in those places. Apply grease moderately, as too much will injure the chicks. The chicks should be examined frequently and the treatment repeated if lice are found on them.

The hen's greatest profit-producing period is the first and second years, and unless a hen is an exceptionally good breeder she should be disposed of at the end of her second laying season and before starting to molt.

## COTTONSEED MEAL.

### Experiments Show that Chickens May Be Fed Cottonseed Meal with Good Results.

Cottonseed meal in rather limited amounts has been fed, since last November, with excellent results, to a pen of 30 pullets on the experiment farm of the United States Department of Agriculture. These pullets have averaged 52.3 eggs each in 20 weeks, from November 1 to March 20, which is practically equal to the best egg yield received this year from any of the other experimental rations. No bad effects have been noted from this feed, either in the eggs or in the condition of the fowls, and the hens eat it freely. The ration is as follows:

SCRATCH MIXTURE.	DRY MASH.
1 pound cracked corn.	2 pounds cottonseed meal.
1 pound wheat.	2 pounds beef scrap.
1 pound oats.	4 pounds bran.
	5 pounds middlings.
	9 pounds corn meal.

The scratch mixture is fed sparingly so that the hens eat about equal parts of this mixture and of the dry mash.

A large per cent of cottonseed meal in a dry mash without any beef scrap has not given satisfactory results. Pullets fed a ration with 33 per cent cottonseed meal averaged only 33.2 eggs apiece in one year. A considerable per cent of these eggs had discolored yolks, with green or brownish-green spots, making them unfit for market.

These results appear to indicate that cottonseed meal can be fed at the rate of about 10 per cent of the mash, or 5 per cent of the total ration, with an equal per cent of beef scrap with excellent results. In sections where cottonseed meal is produced, half of the beef scrap in the mash apparently can be replaced by cottonseed meal with excellent results.

## INFERTILE EGGS BEST.

### Save the Spoilage That Comes from Letting the Male Bird Run with the Flock.

The farmers of the United States lose each year large sums because of improper methods of producing and handling eggs. One-third of this loss is easily preventable. It is due to the partial hatching of fertile eggs.

The eggs laid by a hen may be either fertile or infertile, depending on whether or not the male bird has been allowed to run with the female. A fertile egg is one in which the germ has been fertilized by the male bird. Except for this process of fertilization the male bird has no influence upon the eggs which the hens lay. Egg production is equally great in flocks from which roosters are excluded.

A fertile egg does not keep as well as an infertile one because the fertilized germ responds more readily to high temperatures than the unfertilized one. It is impossible to hatch an infertile egg or to cause a blood ring to form in one. Such eggs are much more likely to reach the table in good condition and there is less spoilage in shipments composed entirely of them than in mixed shipments of fertile and infertile eggs.

Heat is the great enemy of eggs, both fertile and infertile. Farmers are urged to follow these simple rules, which cost nothing but time and thought and will add dollars to the poultry yard returns:

1. Keep the nests clean; provide one nest for every four hens.
2. Gather the eggs twice daily.
3. Keep the eggs in a cool, dry room or cellar.
4. Market the eggs at least twice a week.
5. Sell, kill, or confine all male birds as soon as the hatching season is over.

## GRAZING CROPS FOR POULTRY.<sup>1</sup>

[Adapted to the latitude of the southern boundary of Pennsylvania.]

Crop.	When sown.	Seed per acre.	Grazing period.	
			Stage.	Duration.
Peas and oats.....	About Apr. 15.....	1 bushel peas, 2 bushels oats.	About May 20.....	Until full grown.
Chard.....	May 10 to July 1....	3 pounds.....	8 to 10 inches high...	Until consumed.
Rape.....	Beginning Apr. 20..	6 pounds.....	6 to 8 inches high...	Do.
Red clover.....	Aug. 20.....	12 pounds.....	About May 15.....	Until fed down closely.
Turnips.....	do.....	3 pounds.....	Sept. 20.....	Until snow falls.
Buckwheat.....	May 10 to July 1....	1 bushel.....	6 weeks.....	Until mature.
Soy beans.....	May 10 to June 10..	do.....	12 to 15 inches high..	
Rye <sup>2</sup> and crimson clover.	Sept. 1.....	1 bushel rye, 15 pounds clover.	Graze early winter and spring.	
Sweet clover.....	Aug. 15 to Sept. 1..	25 pounds.....	8 to 10 inches high..	Until fed down or too tough.
Alfalfa.....	August.....	20 pounds.....	do.....	Alternate periods.

<sup>1</sup> Suggestions by the Division of Forage Crop Investigations of the Bureau of Plant Industry. This phase of the investigation has received little attention from the viewpoint of poultry grazing, especially as to the relation of the number of fowls to area of crops.

<sup>2</sup> Winter wheat may be substituted for rye. Farther north substitute hairy vetch for crimson clover.



# PRODUCE INFERTILE EGGS!

*Fertile Eggs SPOIL QUICKLY  
in Summer Weather*

*Infertile Eggs KEEP Best and  
MARKET Best in Summer Heat*

## FERTILE EGGS COST THE FARMER AN ENORMOUS SUM EACH YEAR

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Farmers lose millions of dollars annually from bad methods of producing and handling eggs. One-third of this loss is preventable, because it is due to the partial hatching of fertile eggs which have been allowed to become warm enough to begin to incubate.

*The rooster makes the egg fertile  
The fertile egg makes the blood ring*

You can save the money now lost from blood rings by keeping the male bird from your flock after the hatching season is over.

The rooster does not help the hens to lay. He merely fertilizes the germ of the egg. The fertile germ in hot weather quickly becomes a blood ring, which spoils the egg for food and market. Summer heat has the same effect on fertile eggs as the hen or incubator.

### INFERTILE EGGS WILL NOT BECOME BLOOD RINGS

After the hatching season cook, sell, or pen your rooster. Your hens not running with a male bird will produce infertile eggs—quality eggs that keep best and market best.

### *Rules for Handling Eggs on the Farm—*

Heat is the great enemy of eggs, both fertile and infertile. Farmers are urged to follow these simple rules, which cost nothing but time and thought and will add dollars to the poultry yard returns:

1. Keep the nests clean; provide one nest for every four hens.
2. Gather the eggs twice daily.
3. Keep the eggs in a cool, dry room or cellar.
4. Market the eggs at least twice a week.
5. Sell, kill, or confine all male birds as soon as the hatching season is over.

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**NOTICE.** Valuable published information on the raising and care of poultry and eggs and individual advice on these subjects may be obtained by writing to the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.





